Test 3 **Essential Maths 9C Units 5 & 6**

Calculators may be used

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1. (a) Work out $\frac{3}{5} + \frac{1}{4}$ (1 mark)

   (b) Work out $\frac{3}{7} \div \frac{9}{14}$ (1 mark)

   (c) Increase £35 by 5% (1 mark)

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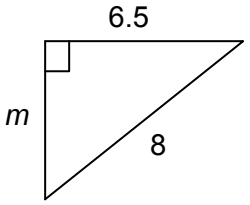
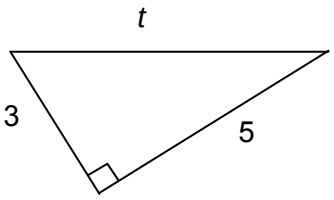
2. Find the side marked by a letter. Give your answers correct to one decimal place.



(2 marks)



(2 marks)

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3. The price of a ticket to watch Chelsea went up from £40 to £48.

   Work out the *percentage* increase in the price. (2 marks)

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4. Copy and complete this "magic" square in which the totals of the numbers in each row, column and main diagonal are the same.

0	-1	
	1	
		2

(3 marks)

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5. A coin is biased so that the probability of tossing a "head" is 0.46.

(a) What is the probability of tossing a "tail" ? (1 mark)

(b) How many "heads" would you expect if the coin is tossed 200 times? (2 marks)

6. (a) A bird is flying at a steady speed of 8m/s.

How long does it take to fly 20m ? (1 mark)

(b) A train takes 4 hours to travel a distance of 260km.

What is its average speed ? (1 mark)

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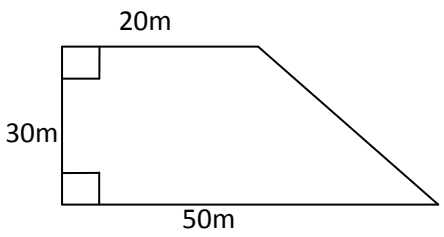
7. Land for building homes costs £450,000 per hectare. (1 hectare = 10,000m^2).

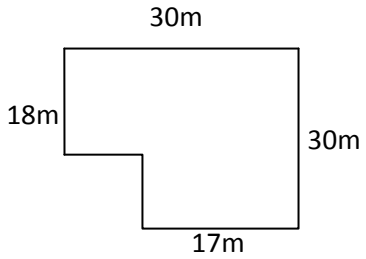
Find the cost of each plot of land below.

(a)



(2 marks)

(b)



(2 marks)

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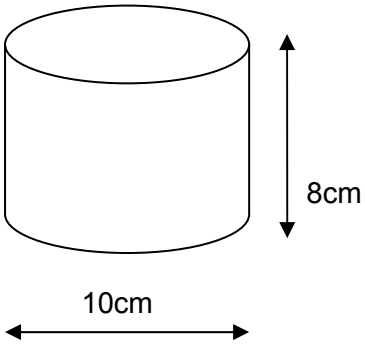
8. (a) Remove the brackets and simplify $3(2x - 1) + 2(4x + 3)$ (1 mark)

(b) Factorise the expression $n^2 + 5n$ (1 mark)

(c) Simplify $n \times (2n)^2$ (2 marks)

9.



This solid cylinder is made of metal with a density of 8g/cm^3.

Work out the weight of the cylinder.

Give your answer in kilograms correct to 2 decimal places.

(3 marks)

10. Write a possible number in the box.

(a) $\square < 150$ (1 mark)

(b) $2 < \square < 3$ (1 mark)

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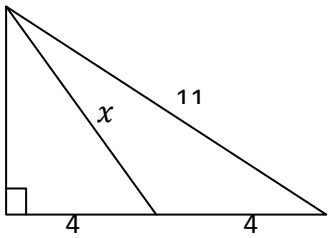
11. Find the length x, correct to one decimal place. The lengths are in cm.



(3 marks)

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12. A bag contains balls which are either yellow, blue or red.

The probability of selecting a yellow ball is 0.15

The probability of selecting a red ball is 0.4

(a) What is the probability of selecting a blue ball? (1 mark)

(b) What is the probability of selecting a ball which is either yellow or blue? (2 marks)

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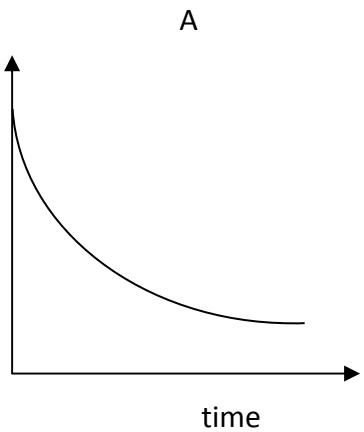
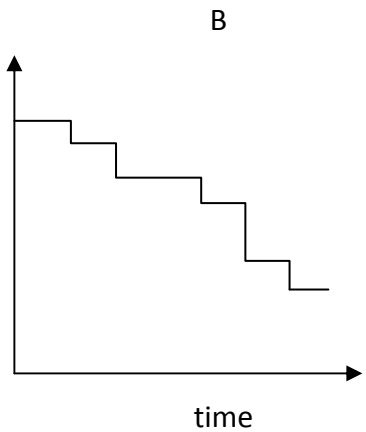
13. Here are two sketch graphs.

One shows the weight of a box of chocolates over a few weeks. The other shows the value of a bike over a period of years.

Decide which graph represents which situation and explain how you decided.





(3 marks)

14. (a) Copy and complete the table for the curve $y = x^2 - 3x$

x		-2	-1	0	1	2	3	4	5
x^2		4					9		
$-3x$		6					-9		
y		10					0		

(3 marks)

(b) On graph paper draw the curve $y = x^2 - 3x$ (2 marks)

(c) On the same graph draw the line $y = x + 3$ (1 mark)

(d) Estimate the x -values at the two points where the line cuts the curve. (2 marks)

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15. The *n*th term of a sequence is $3n + 1$

Find the first 4 terms of the sequence. (2 marks)

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16. Use the method of trial and improvement to find one solution

of the equation $x(x + 3) = 30$

Give your answer correct to one decimal place. (3 marks)

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17. A cupboard weighs 58kg to the nearest kg.

Write down the lower bound for the weight of the cupboard. (1 mark)

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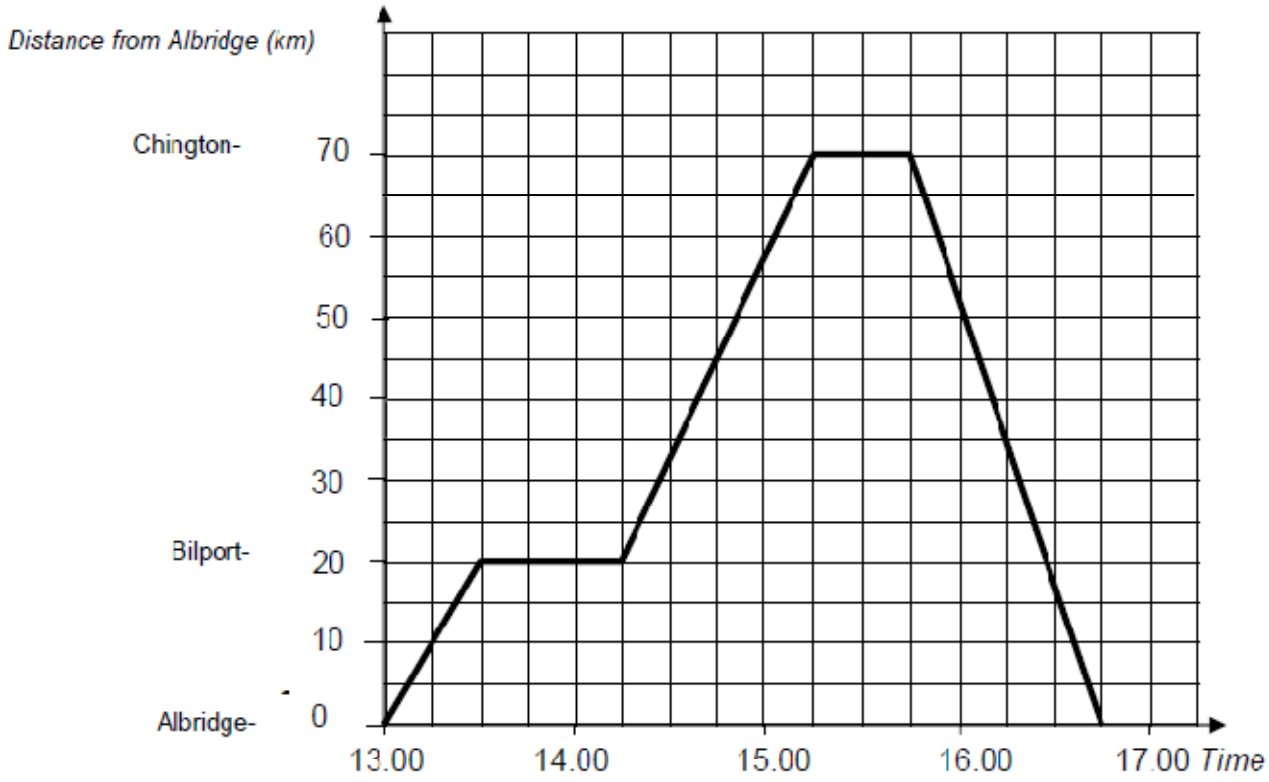
18. Solve the simultaneous equations

$x + 5y = 16$

$4x + 3y = 13$ (3 marks)

19. This graph shows a car journey from Albridge to Chington and back again



(a) For how long does the car stop at Bilport? (1 mark)

(b) When does the car arrive at Chington? (1 mark)

(c) When does the car leave Bilport? (1 mark)

(d) At what speed does the car travel

(i) from Albridge to Bilport? (1 mark)

(ii) from Chington back to Albridge? (1 mark)

(e) At what time on the return journey is the car exactly half-way between Chington and Albridge? (1 mark)

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20. Solve the inequality $8x - 1 \geq 3(2x + 3)$

(3 marks)